MORRIS COUNTY

Radio Communications for the Emergency Services




On Line Training

- This presentation is intended to provide information on Fire & EMS communications using the Morris County trunked radio system.
- This presentation is available as a self guided presentation at morrisoem.org. Click on “Training” at the top of the page, then the presentation to access the course.

Goals & Objectives

- County Radio System background
- Local radio communications
- General radio usage
- Mutual Aid communications
- Motorola Radio Operation

County P25 UHF Trunked Radio System

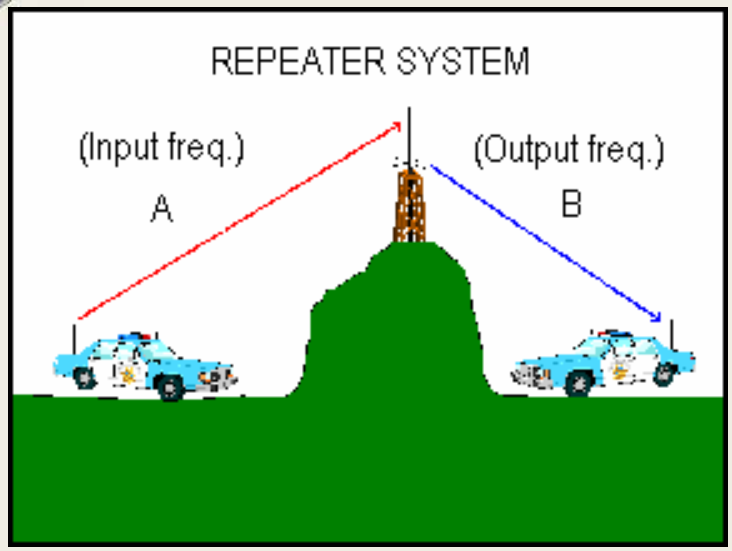
What is Trunking?

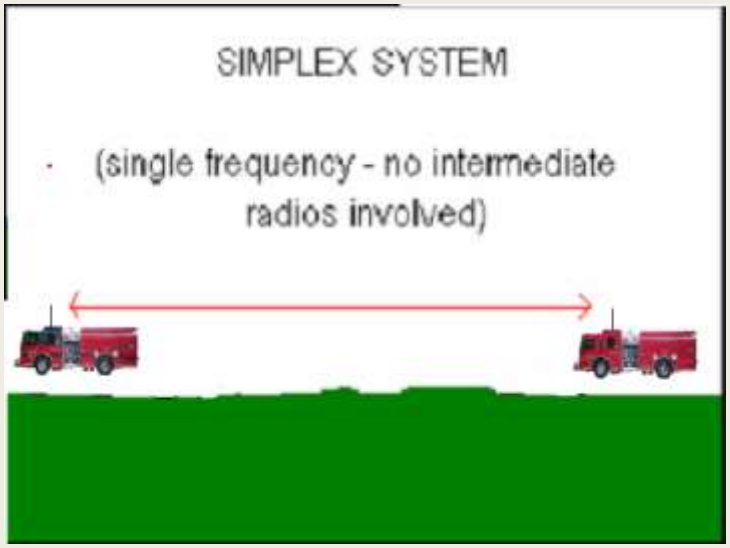
- Multiple frequencies available on a shared basis by all users
- Computer controlled - separates users by group
- Allows for more efficient use of channels which allows greater number of users
- Presently over 4300 units sharing nearly 100 talkgroups
- Detailed radio system technology review available via the U.S. Fire Administration, “Voice Radio Communications Guide for the Fire Service”

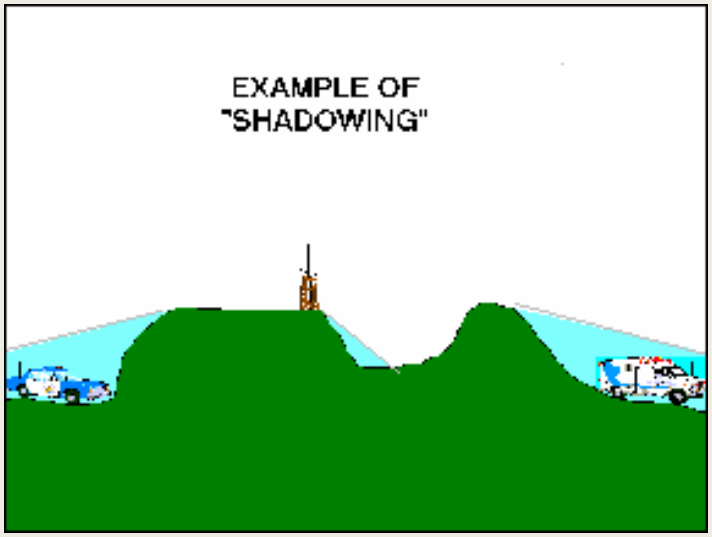
County Trunked Radio System

- UHF Trunked Radio System supported by repeaters through-out Morris County.
- ***On a repeated channel, if the dispatcher can hear you, everyone across the county can too! No need to have dispatcher relay information on the same channel.***
- All Morris County Police, Fire, and EMS emergency services have vehicle mounted radios
- Dispatch centers have interop capability (MIRS/OPS)
- ALL Morris County Fire Chiefs, EMS Rescue Captains & OEM Coordinators have been provided with compatible portable radios.
- ALL radio's are assigned, and may be disabled by Morris County Communication Center if the system is abused or used improperly.

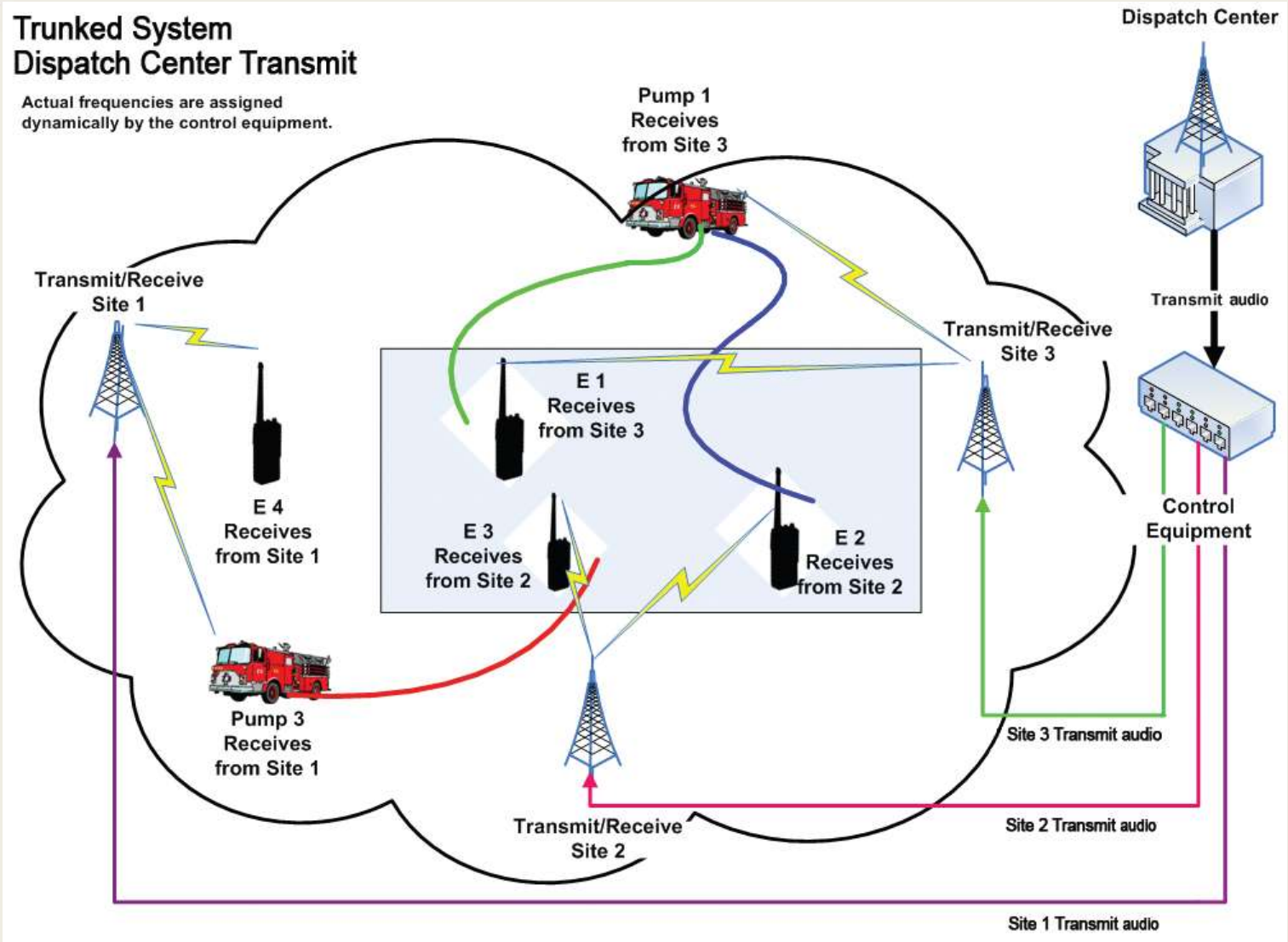
County Radio System





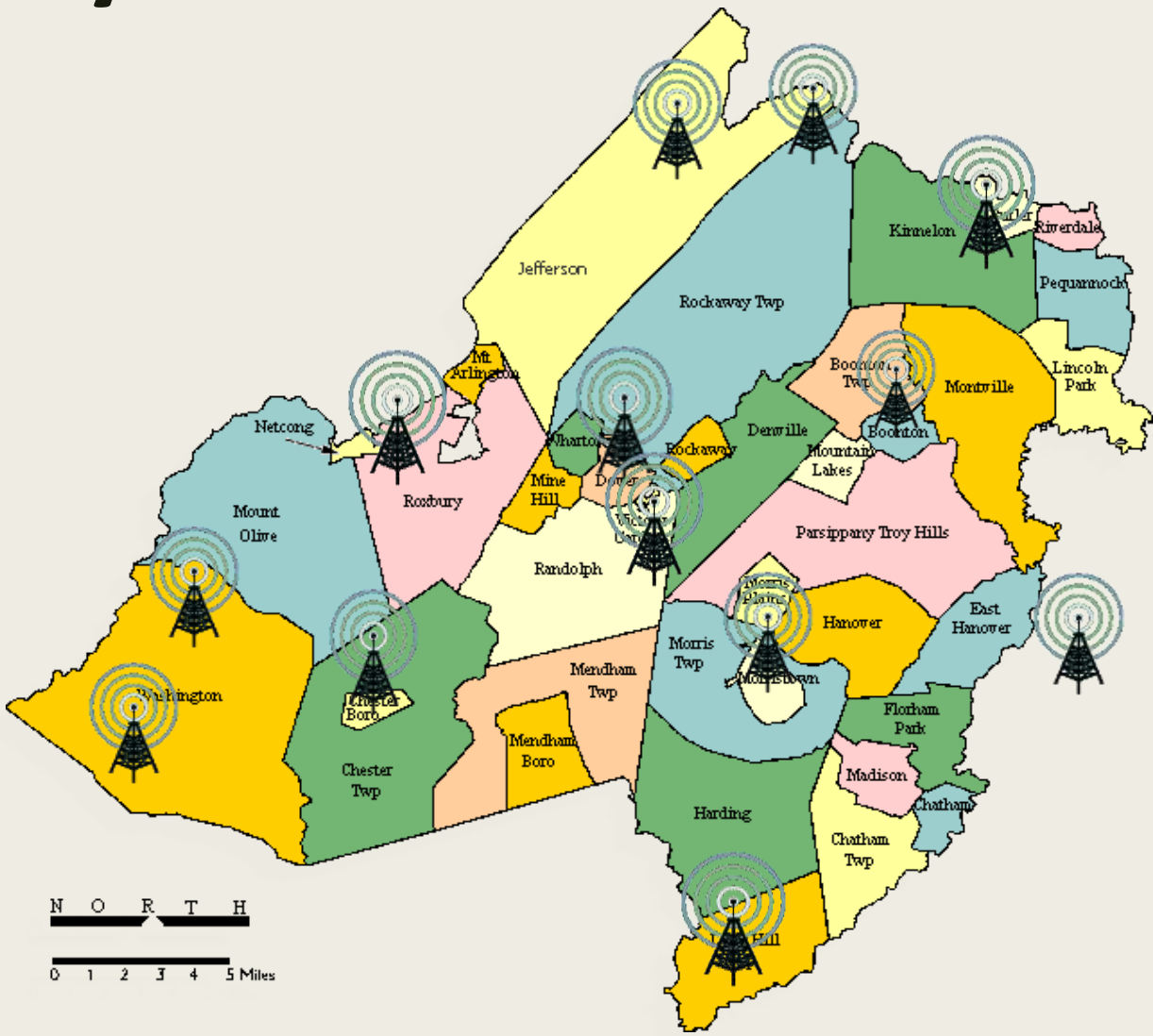


Trunked Radio System



County Radio Tower Sites

- Randolph (Master)
- Boonton
- Chester
- Dover
- Jefferson
- Kinnelon
- Livingston
- Long Hill
- Morristown
- Netcong
- Rockaway Twp.
- Washington Twp. (2)



Transmitting on the Trunked Radio System

- When you push the Transmit key a “Chirp” type sound will be heard.
- Wait until after this tone is complete, then begin speaking. This tone is the radio connecting with the repeater.
- If you speak immediately and do not wait for the “Chirp” to complete, part of your message will be cut out.
- If you hear a “BUZZ” type sound, you cannot connect with a repeater, and therefore cannot transmit. Either because you are out of range, or because someone else was transmitting at the exact same time. Wait a few seconds or move a short distance (as little as across the street) then try transmitting again.

Talk Group (Channel) Programming

- Municipal/Local & County talk group programming is slightly different for Police, Fire & EMS agencies.
- But, all Emergency Services have similar, common programming, for easier interoperability between all agencies. OPS 1-9 is in Fire/EMS radios ONLY.
- To communicate between any Municipality, whether dispatched by County or not, you must use the appropriate operations Talk Group assigned by the communications center for the incident.
- Operations talk groups can ONLY be assigned by the comm. center. Agencies can NOT freelance to any OPS talk group without County permission.

Radio Programming

FIRE – Dispatched by County

	Bank A1	Bank B1	Bank C1	Bank A2	Bank B2	Bank C2
1	Fire Response n	OPS 10	CUSTOM	UCALL40-RP	UCALL40-TA	MC BU1 ZR
2	OPS 1	OPS 11		UTAC41-RP	UTAC41-TA	MC BU2 ZR
3	OPS 2	OPS 12		UTAC42-RP	UTAC42-TA	MC BU3 ZR
4	OPS 3	OPS 13		UTAC43-RP	UTAC43-TA	MC BU4 ZR
5	OPS 4	OPS 14		UTAC44-RP	UTAC44-TA	MC BU1 ZB
6	OPS 5	OPS 15		UTAC45-RP	UTAC45-TA	MC BU2 ZB
7	OPS 6	OPS 16		UTAC46-RP	UTAC46-TA	MC BU1 ZJ
8	OPS 7	OPS 17		UTAC47-RP	UTAC47-TA	MC BU2 ZJ
9	OPS 8	OPS 18		UTAC48-RP	UTAC48-TA	MC BU1 ZL
10	OPS 9	OPS 19				MC BU2 ZL
11	Fireground 1	OPS 20			FG1 EVAC	MC BU1 ZW
12	Fireground 2	OPS 21		DynRgrp	FG2 EVAC	MC BU2 ZW
13	Fireground 3	OPS 22			FG3 EVAC	PSIC1
14	Fireground 4	OPS 23		FD Emergency	FG4 EVAC	PSIC2
15		OPS 24		ALLCOM		PSIC3
16	Fire Response n	OPS 25		MIRS1	ALL-IOP	PSIC4

Radio Programming

EMS – Dispatched by County

	Bank A1	Bank B1	Bank C1	Bank A2	Bank B2	Bank C2
1	EMS Response n	OPS 10	CUSTOM	UCALL40-RP	UCALL40-TA	MC BU1 ZR
2	OPS 1	OPS 11		UTAC41-RP	UTAC41-TA	MC BU2 ZR
3	OPS 2	OPS 12		UTAC42-RP	UTAC42-TA	MC BU3 ZR
4	OPS 3	OPS 13		UTAC43-RP	UTAC43-TA	MC BU4 ZR
5	OPS 4	OPS 14		UTAC44-RP	UTAC44-TA	MC BU1 ZB
6	OPS 5	OPS 15		UTAC45-RP	UTAC45-TA	MC BU2 ZB
7	OPS 6	OPS 16		UTAC46-RP	UTAC46-TA	MC BU1 ZJ
8	OPS 7	OPS 17		UTAC47-RP	UTAC47-TA	MC BU2 ZJ
9	OPS 8	OPS 18		UTAC48-RP	UTAC48-TA	MC BU1 ZL
10	OPS 9	OPS 19				MC BU2 ZL
11	EMS Direct	OPS 20				MC BU1 ZW
12		OPS 21		DynRgrp		MC BU2 ZW
13		OPS 22				PSIC1
14		OPS 23		EMS Emergency		PSIC2
15		OPS 24		ALLCOM		PSIC3
16	EMS Response n	OPS 25		MIRS1	ALL-IOP	PSIC4

Radio Programming

FIRE – NOT dispatched by County

	Bank A1	Bank B1	Bank C1	Bank A2	Bank B2	Bank C2
1	Fire Mutual Aid	OPS 10	CUSTOM	UCALL40-RP	UCALL40-TA	MC BU1 ZR
2	OPS 1	OPS 11		UTAC41-RP	UTAC41-TA	MC BU2 ZR
3	OPS 2	OPS 12		UTAC42-RP	UTAC42-TA	MC BU3 ZR
4	OPS 3	OPS 13		UTAC43-RP	UTAC43-TA	MC BU4 ZR
5	OPS 4	OPS 14		UTAC44-RP	UTAC44-TA	MC BU1 ZB
6	OPS 5	OPS 15		UTAC45-RP	UTAC45-TA	MC BU2 ZB
7	OPS 6	OPS 16		UTAC46-RP	UTAC46-TA	MC BU1 ZJ
8	OPS 7	OPS 17		UTAC47-RP	UTAC47-TA	MC BU2 ZJ
9	OPS 8	OPS 18		UTAC48-RP	UTAC48-TA	MC BU1 ZL
10	OPS 9	OPS 19				MC BU2 ZL
11	Fireground 1	OPS 20			FG1 EVAC	MC BU1 ZW
12	Fireground 2	OPS 21		DynRgrp	FG2 EVAC	MC BU2 ZW
13	Fireground 3	OPS 22			FG3 EVAC	PSIC1
14	Fireground 4	OPS 23		FD Emergency	FG4 EVAC	PSIC2
15		OPS 24		ALLCOM		PSIC3
16	Fire Mutual Aid	OPS 25		MIRS1	ALL-IOP	PSIC4

Radio Programming

EMS – NOT Dispatched by County

	Bank A1	Bank B1	Bank C1	Bank A2	Bank B2	Bank C2
1	EMS Mutual Aid	OPS 10	CUSTOM	UCALL40-RP	UCALL40-TA	MC BU1 ZR
2	OPS 1	OPS 11		UTAC41-RP	UTAC41-TA	MC BU2 ZR
3	OPS 2	OPS 12		UTAC42-RP	UTAC42-TA	MC BU3 ZR
4	OPS 3	OPS 13		UTAC43-RP	UTAC43-TA	MC BU4 ZR
5	OPS 4	OPS 14		UTAC44-RP	UTAC44-TA	MC BU1 ZB
6	OPS 5	OPS 15		UTAC45-RP	UTAC45-TA	MC BU2 ZB
7	OPS 6	OPS 16		UTAC46-RP	UTAC46-TA	MC BU1 ZJ
8	OPS 7	OPS 17		UTAC47-RP	UTAC47-TA	MC BU2 ZJ
9	OPS 8	OPS 18		UTAC48-RP	UTAC48-TA	MC BU1 ZL
10	OPS 9	OPS 19				MC BU2 ZL
11	EMS Direct	OPS 20				MC BU1 ZW
12		OPS 21		DynRgrp		MC BU2 ZW
13		OPS 22				PSIC1
14		OPS 23		EMS Emergency		PSIC2
15		OPS 24		ALLCOM		PSIC3
16	EMS Mutual Aid	OPS 25		MIRS1	ALL-IOP	PSIC4

Radio Programming

- The only significant difference between those dispatched by county and those not, is channel A-1.
- Extended or major operations will always be assigned a common OPS channel.
- Towns dispatched by County have a response talkgroup to communicate with the dispatcher and provide coordination with own units for routine calls.
- Towns not dispatched by County have a mutual aid talkgroup to contact the County for an OPS channel assignment.

Where are we going?

- *The Middle Class Tax Relief and Job Creation Act of 2012* (Public Law 112-96) requires the Federal Communications Commission (FCC) to recover and auction T-Band spectrum, currently in use by public safety agencies, for commerical use by February 2021. Additionally, the Act requires the FCC to clear public safety operations from this portion of the band within two years of auction close (i.e., early 2023). The ultra-high frequency (UHF) spectrum between 470–512 megahertz (MHz)—also known as the "T-Band"—supplies a significant complement of channels to support public safety operations and regional interoperability in 11 of the largest U.S. metropolitan areas.
- **Proceeds from the auction may not cover the full costs of relocation.** The law requires proceeds from the auction to be made available to cover "sums necessary" to relocate the public safety licensees. NPSTC believes the costs of relocation may exceed the amount that may be raised from the auction.
- Given the shortage of spectrum in certain areas, the cost of relocation, and the potential disruption to public safety communications, NPSTC concluded that the transition from the T-Band is not practical or feasible, and urged Congress to reconsider this mandate.

What is the status?

- Licensing granted for seven 700 MHz channel pairs
- Project $200K-250K for engineering and additional frequency allocations
- Anticipate $18M-$22M total project cost just for Morris County!

Region	Licensees	Channels Licensed	RF Sites	Repeaters	Mobiles/ Portables
Boston	209	596	636	1,081	30,439
Chicago	114	279	212	477	23,965
Dallas	19	55	51	95	3,392
Houston	6	7	8	8	277
Los Angeles	50	546	474	7,814	41,701
Miami	15	43	28	70	2,067
New York	222	1054	751	3,348	94,831
Philadelphia	150	790	467	2,893	61,734
Pittsburgh	30	107	88	369	9,598
San Francisco	54	216	234	694	16,990
Washington, DC	22	129	87	465	10,103
Totals	925	3,822	3,036	17,314	295,097

Radio Communications

General Usage

Fire/EMS Communications
(dispatched by County)

- Dispatched via MC UHF Paging alert, 476.2875 MHz, from all 13 tower sites simultaneously
- Chief's & Apparatus communicate with each other and County Dispatch via FIRE or EMS Response TG, or assigned OPS TG while in route and up to arrival on scene.
- Upon arrival, all Fire Ground Communications are on a local fireground/direct channel

Monitored Talkgroups

- All Morris County Channels are available at Comm. Center consoles
- All repeated channels are recorded at the Comm. Center.
- Every unit is identifiable and any radio can be turned off remotely if lost or abused.
- Use Direct/local Channels for long messages and traffic not appropriate on the trunked system which transmits countywide.

General Radio Usage

- All Must comply with NIMS
- Use only “Clear text”/Plain Language – NO TEN CODES
- Dispatch center is “COUNTY”
- Vehicle ids – Town name / service / #
- Only relevant communication to dispatcher
  - *responding, on scene, size-up, etc.*

General Radio Usage

- Keep transmissions, brief, concise, relevant
- DO NOT use for:
  - *“On the air”*
  - *“Awaiting crew” or ”standing by”*
  - *Driver training*
  - *Fuel runs*
  - *Non-emergency details (unless assigned OPS TG by communications center)*
- Only I.C. needs to clear all units from a scene

General Radio Usage

- Avoid “buzz words” or unnecessary extensions of transmissions, i.e.
  - *“At this time”*
  - *“Be advised”*
  - *transmissions not relevant to the incident run card*
- Remember the term “DIM-WIT”*: “Does It Matter What I’m Transmitting?” If not, **stay off the radio**.
- Dispatch will contact the IC at 20 minute intervals for Status updates

* with a nod to Chief Billy Goldfeder

Call Signs to be used for all contacts

- All units should use naming established by County Active Chiefs Alliance in 2006.
- Apparatus

Town or Company name, Vehicle Type, Company number (if applicable), Sequence Number

- Officers

Town or Company name, Position, Company Number (if applicable), ID Number. i.e.

Chief

Assistant/Deputy/Battalion

Captain

Lieutenant/Engineer, etc.

NIMS Vehicle/Resource Types

- Engine
- Ladder
- Platform
- Quint
- Brush
- Tender
- Utility
- Cascade
- Rescue
- Boat
- Haz-Mat
- EMS
- ALS/BLS

Fire Ground Call Sign's

- To avoid confusion on the fire ground, only utilize recommended call signs to speak with other units.
- In the event that you wish to communicate with an assignment or function being performed you can use the assignment as the call sign, such as "Roof", "1st Floor Interior", "Hose Line", etc.
- In the event that a firefighter has no assigned call sign or assignment, they can use their last name as a call sign. An example is "Smith to *Town* Engine 41"

Mutual Aid

Mutual Aid Radio Communication Overview

- Fire & EMS Response to the County Comm. Center and initial direction done via “Mutual Aid” talkgroup (Channel A-1) if not dispatched by Morris County
- Incidents assigned OPS TG by Comm. Center
- Use Fire Ground/EMS Direct for local, on-scene

Mutual Aid Response

- When responding as mutual aid, the IC will contact the host agency using an assigned OPS radio talkgroup as requested by the host agency or assigned by the Morris County Comm. Center.
- Other apparatus should await instructions from the IC on their normally assigned frequency or OPS talkgroup, and also communicate amongst other units on their primary response frequency unless instructed otherwise.
- On scene, units should utilize their normal local, direct **fireground** channel(s)

Mutual Aid Response

Some agencies prefer when requesting mutual aid that only the requested agency IC contact them and relay any needed messages to responding mutual aid apparatus via their own department's frequency.

Mutual Aid Talk Group

(not dispatched by County)

- **FIRE/EMS Mutual Aid (Channel A-1)**

✓ Mutual Aid should contact the Comm. Center for assigned OPS channel when responding to mutual aid.

✓ I.C. should contact the Comm. Center for OPS channel assignment when requesting mutual aid.

✓ Most times the dispatcher will assign an OPS channel at the time of the call.

Common Error – Using MIRS 1

MIRS 1 is meant for communication to/from DISPATCH Centers, not as a mutual aid response talk group for responding apparatus

Radio Operation

Motorola Radio's

UHF Trunked Radio System Radios

- Mobile Unit = XTL 2500, APX4500/6500
- Portable Radio = XTS 1500/2500, APX4000/6000
- Capable of Transmitting in Digital or Analog format.
- Both have dual capability to RECEIVE Digital and Analog transmissions.
- Narrow Band operation complies with FCC rules for 1/1/2013
- Other makes/models are functional

Motorola XTL 2500 Mobile Radio

Home (Press & Hold)

Talk Group/Channel Selector

Volume Control

On/Off Button

Zone Select

Motorola XTL 2500 Mobile Radio

Dim (3 settings)

Scan On/Off

To get to second row

View/Program Scan List (**from** second row)

Direct/repeat mode (Conventional) Signal Strength (Trunked)

Scan Nuisance delete

Changing “Zones”

XTL 2500 with “ZNUP” Function

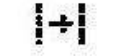
Use “Talk Group/Channel Selector” to appropriate Talk Group

Press to switch between zones

Portable Radios

Motorola Portable

Display Status Symbols

	**Battery** • Conventional = Blinks when the battery is low. • Smart = The number of bars (0-3) shown indicates the charge remaining in your battery.
	**Talkaround**. You are talking directly to another radio or through a repeater; **On** = direct; **Off** = repeater
	**Monitor (Carrier Squelch)**. This channel is being monitored.
	**Scan.** The radio is scanning a scan list.

TURNING THE RADIO ON AND OFF

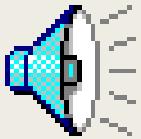
- To turn the radio on, push the power button
- Adjust volume knob (left side) clockwise to the desired volume setting.
- Wait for the radio to affiliate with the system.
- To turn the radio off, push the power button

SELECTING A TALKGROUP

- To select a talkgroup, simply turn the right hand knob (mode knob).

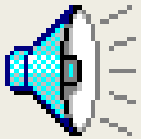
TRANSMITTING AND RECEIVING

- To transmit, press Push to Talk button.
- **Wait for permission to talk tone!**
- Begin transmitting your message.
- When completed, release the Push to Talk button.



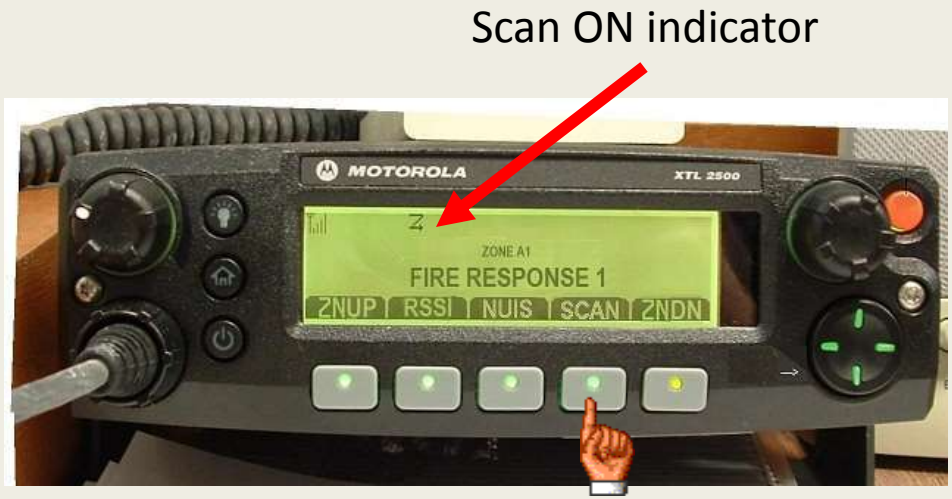
TRANSMITTING AND RECEIVING

- If the system is busy, you will hear a tone indicating that you are unable to transmit.
- Your transmission is placed into the “busy queue” in the order that it is received.
- When the system is available, you will hear the permission to talk tone.



SCAN FEATURE

- To activate or de-activate the scan feature, simply push the scan button.
- Scans selected channel, primary response channel, others user selected



HOME BUTTON

- Pressing the Home button will automatically switch your radio to your home talkgroup, channel A-1

DISPLAY BRIGHTNESS

- You can adjust the display brightness by pressing the “Dim” button until the desired brightness is achieved.

County Radio System

Display buttons

ZNUP	RSSI/DIR	NUIS	SCAN	ZNDN	SCLS
To change zones upward	Signal strength (trunking) Direct/Repeat mode (conventional)	Delete channels temporarily in scan	Turn scan on and off ON indicated by Z in window.	To change zones downward	(next page) view or change channels in scan list

Video training

Radio usage and operation videos available to view at

http://mcoemtraining.blogspot.com

Radio Usage

- Using the “IAFC Best Practices” transmit audio quality and intelligibility improves significantly.
- Keys for improvement
  - *The position and angle of the radio microphone*
    - Holding the radio microphone 1-2 inches directly in front of the mouth (*IAFC Best Practice, Section 1, Recommendation 2*)
  - *The volume level and clarity of voice*
    - Speaking in a loud (not shouting), clear voice produces the best transmit audio quality and intelligibility (*IAFC Best Practice, Section 1, Recommendation 3*)
    - Minimize background (i.e. sirens, pump/engine noise)

IAFC Best Practices

Radio Mic Position No. 1

CONSOLE POSITION (12" or further from the mouth)

Fire Truck Driving

Fire Truck Driving with Sirens

Radio Mic Position No. 2

STANDARD POSITION (6-8" from the mouth)

Fire Truck Driving

Fire Truck Driving with Sirens

Radio Mic Position No. 3

"BEST PRACTICES" POSITION (1-2" from the mouth)

Fire Truck Driving

Fire Truck Driving with Sirens

Questions?

- contact MCOEM at 973-829-8600

or

- Communications at 973-829-8190